Concept Pro

VHSDIR-870EXT-IP

EXTERNAL IP HIGH SPEED DOME

PLUG & PLAY

HD-IP

USER MANUAL

About this Document

Purpose

This document is for the VHSDIR-870EXT-IP, including the product features, hardware installation, network access, network configuration, technical specification and troubleshooting.

Intended Audience

This document is intended for:

- Technical support engineers.
- Maintenance engineer.
- End user.

Symbol conventions

The symbols that may be found in this document are defined as followed:

Symbol	Description
DANGER	Alerts you to a high risk hazard that could, if not avoided, result in moderate or minor in injury.
WARNING	Alerts you to a medium or low hazard that could, if not avoid, result in moderate or minor in injury.
CAUTION	Alerts you to a potentially hazardous situation that could, if not avoid, result in damage, data loss, performance deterioration, or unanticipated results.
TIP	Provide a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points in the main text.

Special notices

When using video surveillance products, comply with applicable statutory and regulatory requirement to enable and maintain legal surveillance cameras. It is illegal for a company or person to install surveillance cameras in an office to monitor employees outside the scope of local law, or to use surveillance cameras to invade other people's privacy with illegal purposes.

Contents

About this document..... i
Contents..... iii
1. Installation Preparation.....1
1.1 Safety Precautions.....1
1.2 Check the Installation Environment.....3
1.3 Network Plan.....3
2 Camera Port and Description.....4
2.1 Product Appearance.....4
2.2 Features.....9
3 Hardware Installation.....10
3.1 Preparing Installation Tools.....10
3.2 Installing a Dome Camera.....11
4 Finding the Cameras IP Address.....16
4.1 Finding the Cameras IP Address using HD-IP.....16
4.2 Finding the Cameras IP Address using UPnP in Windows 7.....17
4.3 Finding the Cameras IP Address using Bonjour in Mac OS.....19
4.4 Finding the Cameras IP Address using BNC Test Cable.....20
5 Configuration.....21
5.1 Login and Logout.....21
5.2 Main Page Layout.....22
5.3 Browsing Video.....23
5.4 Sensor Config.....27
5.5 Device Info.....31
5.6 Device Configuration.....32
5.6.1 Local Network.....32
5.6.2 Device Port.....35
5.6.3 Camera.....35
5.6.4 Date and Time.....36
5.6.5 OSD.....38
5.6.6 Microphone.....40
5.6.7 Dome PTZ.....40
5.6.8 CVBS Configuration/BNC Output.....41
5.6.9 System Configuration.....42
6 Stream Configuration.....43
7 Alarm Configuration.....45
7.1 Alarm I/O.....45
7.2 Disk Alarm.....46
7.3 Network Alarm.....48
7.4 I/O Alarm Linkage.....49
7.5 Motion Alarm.....50
8. Local Record.....52
8.1 Record Policy.....52
8.2 Record Directory.....53
9 Privacy Masking.....56

9 Privacy Masking.....56
10 Network Service.....57
10.1 DDNS.....57
11 Service Centre.....58
11.1 SMTP.....58
12 Privilege Manager.....59
13 Protocol.....61
14 Maintenance.....62
15 Technical Specification.....63
16 Troubleshooting.....66
17 Lightning Proof and Surge Signal Proof.....67
18 Declaration on Hazardous Substances in Electronic Information Products.....69

1. Installation preparation

1.1 Safety precaution

The following precautions provide important information to prevent fire and personal injury caused by improper use of the VHSDIR-870EXT-IP. Read this section carefully before installing the camera and comply with these cautions during use. If you want to install the camera in a public place, provide a warning message such as "CCTV camera are in operation".

CAUTION

The camera may be upgraded without prior notice.

- For the latest program and supplementary documentation, contact your supplier
- If any problems occur during use, contact your supplier

Basic precaution

- Install the camera in strict accordance with the manufacture requirement.
- Never open or disassemble the camera unless it is by a qualified or professional person, as this product maybe damaged or cause electrical shock.
- No unit and individual are allowed to change the camera structure, safety configuration, and performance without authorization.
- Use the camera in accordance with related laws and with respect for other's legal rights.

Power supply precautions

- Use power compliances with the local electrical safety standards during camera installation.
- Use a power adapter matching this camera. The power supply voltage must meet the input voltage requirement.
- Never power on the camera before installation is completed. Before installing or removing a cable, stop using the camera and power it off.
- Verify that the correct power supply is used before using the camera.

- Keep the power plug clean and dry to prevent electric shock or other risks.

Precaution For Use

- Avoid heavy weight, violent vibration, soaking during transport, store, and installation. Otherwise, the camera may be damaged. Any damage caused by improper transport of the assembled camera during delivery from or sending back to the manufacture for repair causes the warranty to be void.
- Never install the camera upside down. Hold the camera core carefully. Never tightly press any structural parts, otherwise it could damage the camera.
- Never dissemble the camera to repair it. The camera must be checked and repaired by professional CCTV installer.
- If smoke is blown out of the camera, the camera sounds abnormally, or peculiar smell is found, stop using the camera, power it off, and remove all the cables (such as the power cable and networking cables) connected to the camera.
- If the camera is faulty, contact the supplier for repair.

Clean precautions

- Before cleaning the camera, stop using the camera and power it off, and then remove all cables (such as the power cable and networking cables) connected to the camera.
- Use a soft and dry cloth to clean the camera. If there is any dirt that is difficult to clean, place a few drops of mild detergent on a soft and clean cloth before cleaning. After the dirt is removed, dry the camera with a cloth.
- Never use any volatile solvents (such as the alcohol, benzene, and thinner) or strong and abrasive alkaline detergent; otherwise the camera surface may be damaged or the camera performance may be reduced.

Environment Precautions

- Never allow any water or other liquid to flow into the camera. If any liquid flows into camera by accident, power off the camera, and remove all the cables (such as the power cord and network cable) connected to the camera.
- Avoid heavy weight, violent vibration, soaking during transport, storage, and installation. Otherwise, the camera may be damaged and is not covered under warranty.
- Never install or use the camera in places where flammable or explosive material are stored or in use.

Personnel precautions

- The camera-related installation and maintenance can be only be performed by professional technical engineers or specific installation personnel.

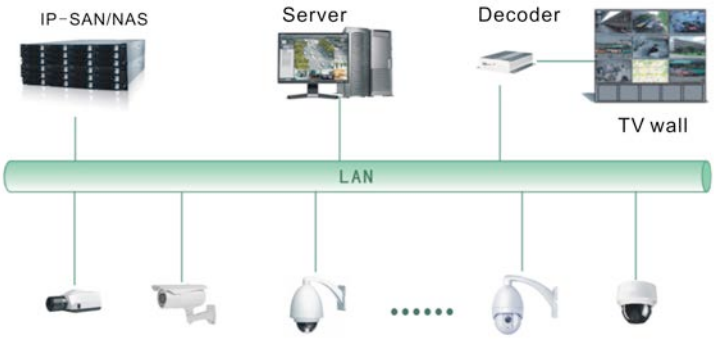
1.2 Checking the Installation Environment

Before installing the camera, check the installation environment according to Table 1-1.

Table 1-1 Installation environment check items

Check Item	Standard
Moisture	The relative environment humidity must be in the range from 5% to 90%. If the humidity is higher than 90%, a dehumidifier must be installed, such as an air conditioner with the dehumidification function or a dedicated dehumidifier. In addition, water seepage, water dropping, and dew forming will damage the camera.
Dust	Make sure the camera is in a dust free area as it could damage the internal workings of the camera.
Lighting	The camera must be installed in the environment that is not in strong light to avoid image blur or a poor image.

1.3 Network Plan



2. Camera Port and Description

2.1 Product Appearance

Figure 2-1 shows the appearance of a VHSDIR-870EXT-IP

Figure 2-1 VHSDIR-870EXT-IP

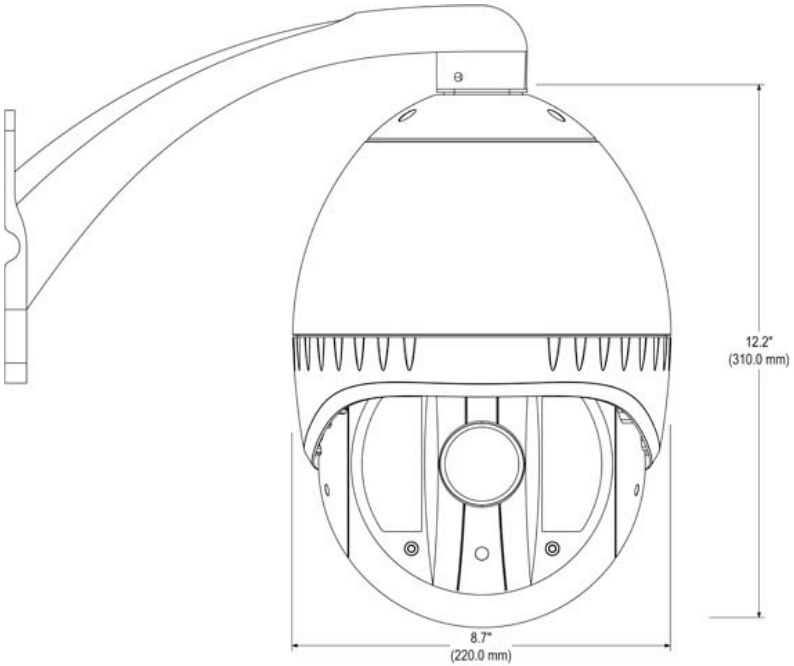


Figure 2-2 shows the structure diagram of the VHSDIR-870EXT-IP.

Figure 2-2 Structure diagram of the VHSDIR-870EXT-IP

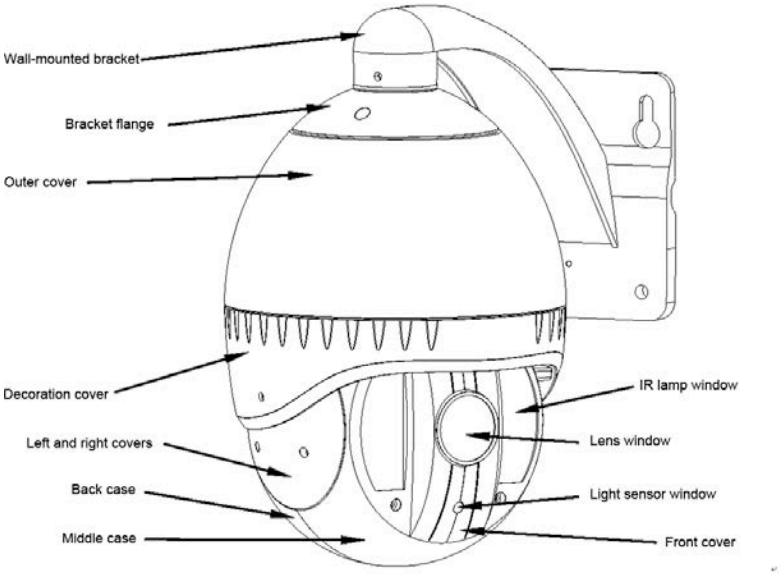


Figure 2-3 shows the multi-head cable used by a dome camera. Table 2-1 describes cores of the multi-head cable.

Figure 2-3 Multi-head cable

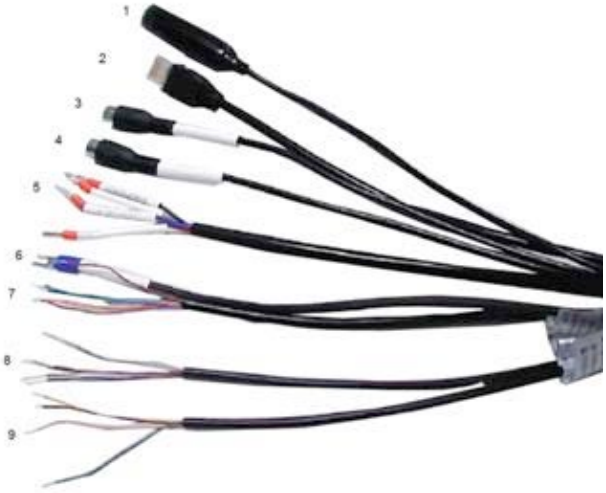


Table 2-1 cores of the multi-head cable

No.	Color	Function	Description
1	N/A	Video output port	You can connect the camera to a TV monitor through this port to view analog video. It also tells you the IP address of the camera.
2	N/A	Network port	Connects a standard Ethernet cable.
3	Red taped core	Audio output	Connects to an external audio device such as a speaker.
4	White taped core	Audio input	Receives analog audio signals from cameras such as a microphone.
5	Red core	AC 24 V power supply wire	The red and black cores supply power for the camera. The blue and white cores supply power for the heater. **NOTE** When the ambient temperature is lower than 5 degrees centigrade
	Black core		
	Blue core		
	White		

No.	Color	Function	Description
	core		(error:±5 degrees centigrade), the heater must be turned on to ensure that the camera runs correctly.
6	N/A	Grounding wire	N/A
7	Yellow core	Alarm output channel 2	Seven alarm input channels and two alarm output channels.
	Orange core	Alarm output channel 2 common terminal	
	Grey core	Alarm input channel 7	
	Blue core	Alarm input channel 6	
	Purple core	Alarm input channel 5	
	Brown core	Alarm input channel 4	
	Green core	Alarm input channel 3	
8	Pink black core	Alarm input channel common terminal	
	Orange black core	Alarm input channel 1	
	Grey black core	Alarm input channel 2	
	Blue black core	Alarm output channel 1 common terminal	
	Purple black core	Alarm output channel 1	
9	Brown black core	RS485 output (negative)	Connects to a keyboard controller to control the camera.
	Green	RS485 output	

No.	Color	Function	Description
	black core	(positive)	
	Yellow black core	RS485 input (positive)	
	Pink core	RS485 input (negative)	

2.2 Features

Network Features

- Supports TCP/IP protocol.
- Supports video, audio, and alarm data.
- Provides a built-in web browser using IE, Google Chrome, Mozilla Firefox and Safari etc.
- Supports network data transmission and remote access.
- Support Point-to-Point protocol over Ethernet (PPPoE), Dynamic Host configuration protocol (DHCP), and Dynamic Domain Name System (DDNS). Protocols.
- Support remote upgrade and maintenance.

Image Processing Features

- Supports multiple steams. Single-stream model or dual-stream mode can be selected based on the site requirement. Encoding parameters for the main stream and sub stream can be configured separately.
- Supports dynamic stream parameters based on different image quality requirement.
- Supports independent hardware compression, constant bit rate (CBR) and variable bit rate (VBR). Videos can be compressed using the Motion Joint Photographic Experts Group（MJPEG）or H.264 standards. The frame rate and image quality can also be configured.

I/O Features

- Support bidirectional intercom and unidirectional broadcast.
- Support RS-485 serial port control and transparent channel transmission.
- Provides a 10/100 Mbits/s self-adaptive Ethernet port.

Other Features

- Supports the heartbeat function that allows the management host to learn the running status of the IP camera in real time.
- Supports alarm input and output, motion detection alarm, and alarm linkage function.
- Supports level-based user rights management.

3. Hardware Installation

3.1 Preparing Installation Tools

Table 3-1 shows a list of installation tools that you may need.

Table 3-1 Installation tools

Tool	Description
Phillips screwdriver	
Claw hammer	
Hammer drill	
Level ruler	
Slotted screwdriver (camera accessory)	
Screw (camera accessory)	
Hexagon wrench (camera accessory)	

3.2 Installing a Dome Camera

Installation Modes

A dome camera supports wall-mounted and suspension installation modes.

NOTE

The following describes how to install a dome camera in wall-mounted and on a ceiling.

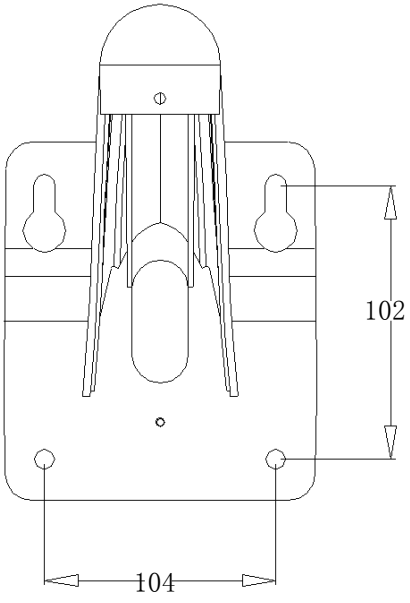
Wall-Mounted installation

Two kinds of bracket could be used. The following are steps for two different brackets, wall mount and pendant mount.

Wall-Mounted Installation I

Mark wall based on bracket size for drilling the holes into the wall. Drill four holes over 60 mm in depth. The bracket installing size is shown in the Figure 3-1.

Figure 3-1 Bracket installing size

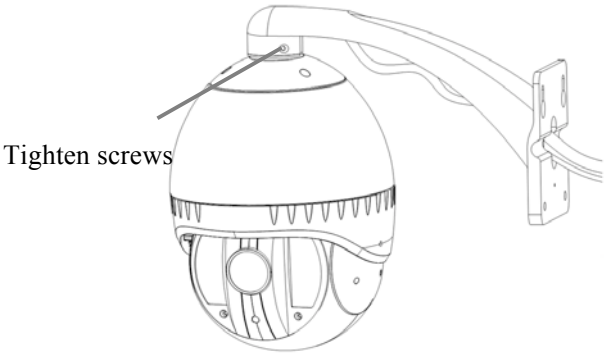


Insert four expansion bolts into the holes.

Attach the PTZ camera to the bracket and rotate the camera clockwise to align the screw holes on the base of the camera and the bracket. Then

tighten the three screws using it to fix the bracket to the camera, shown in Figure 3-2.

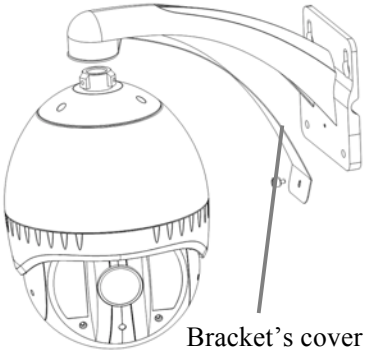
Figure 3-2 Fix the camera and bracket together



Thread all the cables through the cable hole on the side of the bracket

Put on the bracket's cover as shown in Figure 3-3.

Figure 3-3 Put on bracket's cover

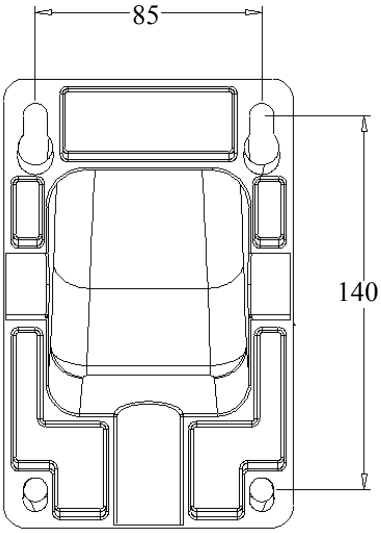


Mounting the PTZ dome camera to the wall, tighten the four screws on the bracket.

Wall-Mounted Installation II

Mark wall based on bracket size for drilling the holes into the wall. Drill four holes over 60 mm in depth. The bracket installing size is shown in Figure 3-4.

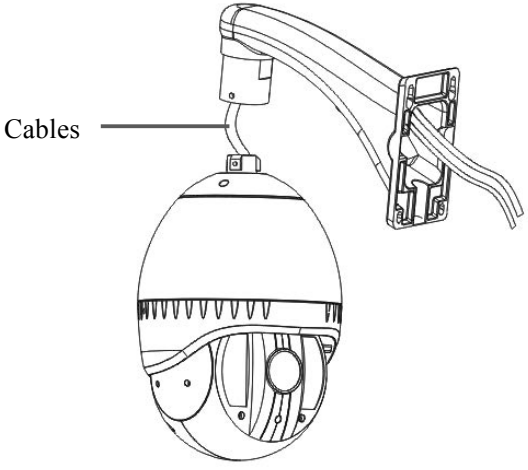
Figure 3-4 Bracket installing size



Insert four expansion bolts into the holes.

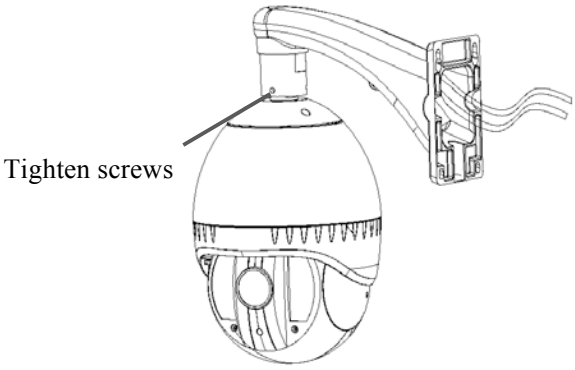
Thread all the cables through the cable hole on the side of the bracket, shown in Figure 3-5.

Figure 3-5 Thread all cables through the bracket



Attach the PTZ camera to the bracket and rotate the camera clockwise to align the screw holes on the base of the camera and the bracket. Then tighten the three screws using it to fix the bracket to the camera, shown in Figure 3-6.

Figure 3-6 Fix the PTZ camera and bracket together

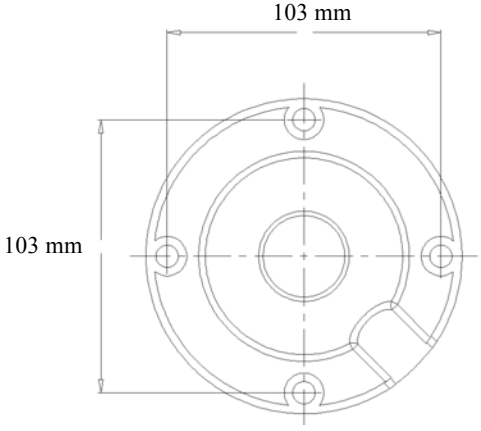


Mounting the camera to the wall, tighten the four screws on the bracket.

Pendant Installation

Mark wall based on bracket size for drilling the holes into the wall. Drill four holes over 60 mm in depth. The bracket installing size is shown in Figure 3-7.

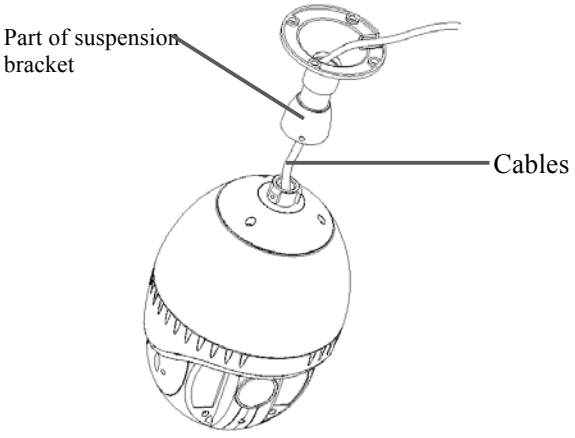
Figure 3-7 Find the hole position and make the mark for drilling the holes



Insert the expansion bolts into the holes.

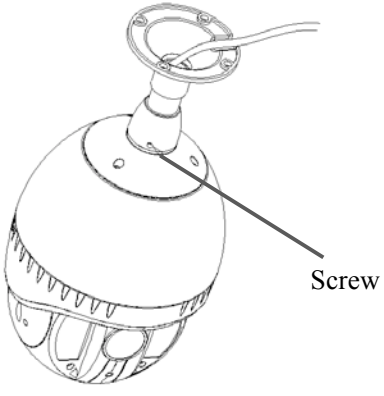
Thread all cables through the cable hole on the side of the pendant bracket, shown in Figure 3-8.

Figure 3-8 Thread the cables through the cable hole on the bracket



Attach the PTZ camera to the bracket and rotate the camera clockwise to align the screw holes on the base of the camera and the bracket. Then tighten the three screws using it to fix the bracket to the camera, shown in Figure 3-9.

Figure 3-9 Fix the pendant bracket and camera together



Mounting the PTZ dome camera to the ceiling and tighten the four screws on the bracket.

4. FINDING THE CAMERA'S IP ADDRESS

Use the steps below to find the camera's IP address and connect to the camera over the local area network (LAN) using HD-IP, UPnP on Windows® 7, or Bonjour® on Mac OS®.

4.1 Finding the Camera's IP Address Using HD-IP

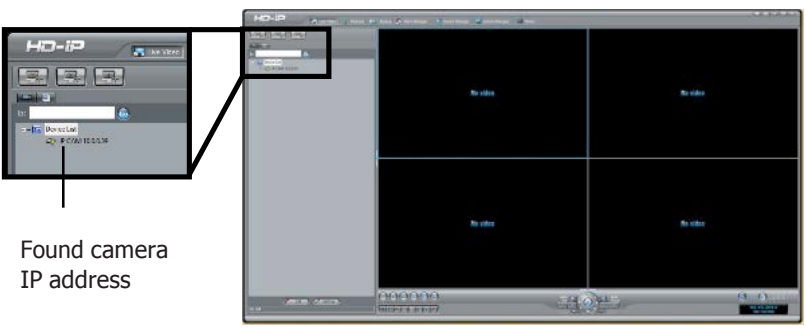
1. Install HD-IP from the USB stick. Now double-click the HD-IP icon ( ) on the Desktop. The log in screen appears.
2. Under User Name and Password, enter the default HD-IP user name (admin) and password (admin). Click Login

Enter admin

Enter admin

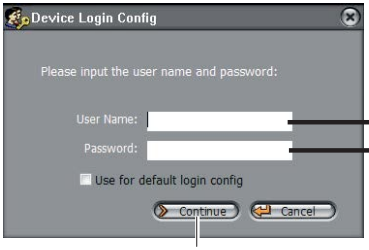
Click Login

3. HD-IP opens and scans the local network for connected cameras. Detected camera IP addresses on the LAN appear in the Device List on the left side of the screen with a icon.



Found camera IP address

4. Click on a camera IP address in the Device List to login.
5. Under **User Name**, enter the user name for the camera (default: **admin**). Under **Password**, enter the password for the camera (default: **admin**). Click **Continue**.

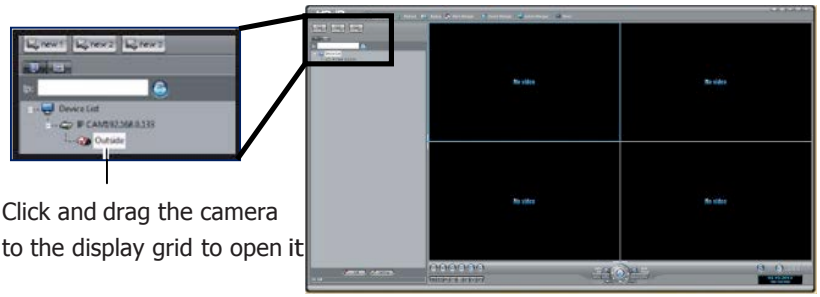


Enter Camera User Name (default: **admin**)

Enter Camera Password (default: **admin**)

Click Continue to login

6. The camera appears under the camera IP address. Click and drag the camera to the display grid to open it.



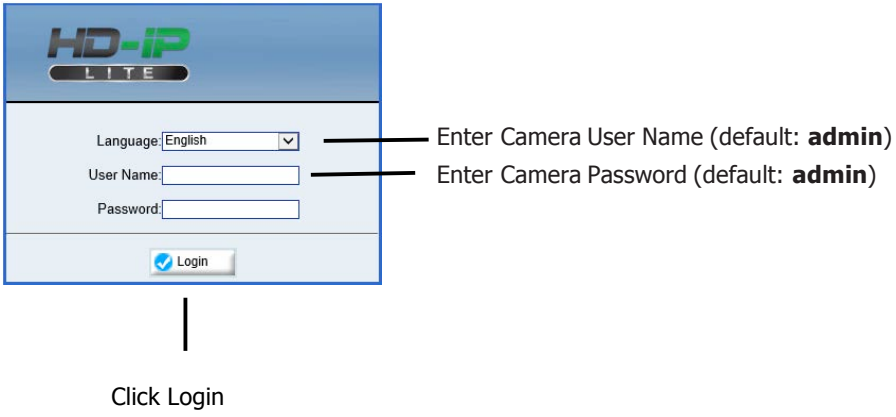
Click and drag the camera to the display grid to open it

4.2 Finding the Camera's IP Address using UPnP in Windows® 7

NOTE: To use this method, your router must support UPnP and the camera and computer must be on the same network. UPnP is enabled in the camera by default, and can be enabled/disabled using HD-IP (check the HD-IP manual for details).

1. Click **Start > Computer > Network**. The camera's IP address appears under Network Infrastructure.

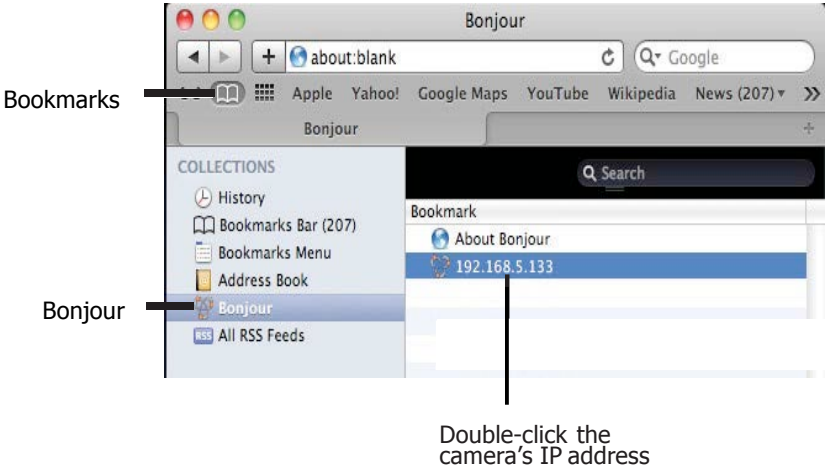
2. Double-click the camera to open it in your default browser.
3. Under **User Name** and **Password**, enter the camera's User Name (default: **admin**) and Password (default: **admin**) and click **Login**.



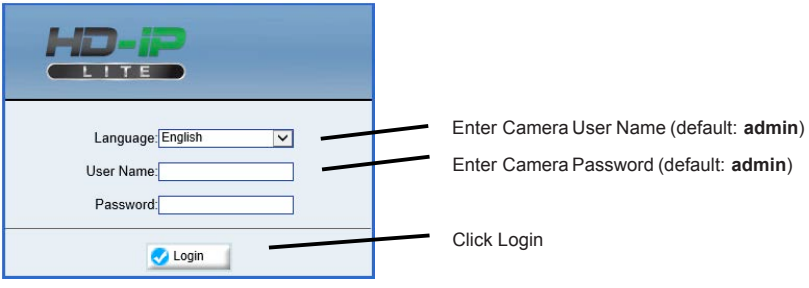
4.3 Finding the Camera's IP Address using Bonjour® in Mac OS®

NOTE: To use this method, the camera and computer must be on the same network. Bonjour® is enabled by default, and can be enabled/disabled using HD-IP (check the HD-IP manual for details).

1. Open Safari® browser and click the Bookmarks button ( )
2. Click **Bonjour**. The camera's IP address appears in the Bonjour Devices list.
3. Double-click the camera to open it in Safari®.



4. Under **User Name** and **Password**, enter the camera's User Name (default: **admin**) and Password (default: **admin**) and click **Login**.



4.4 Finding the Camera IP using the BNC Test Cable

When the BNC test cable is connected to the camera, the IP address is shown on the test monitor. The camera must be connected to power to use the BNC test cable.

NOTE: The default IP address of 192.168.0.120 is shown if the camera cannot obtain an IP address from the router. Check the Ethernet/power connections and router configuration.

5. Configuration

5.1 Login and Logout

CAUTION

You must use Internet Explorer 6 or a later version to access the web management system, otherwise some functions may be unavailable.

Login system

Open the Internet Explorer, enter the IP address of IP camera (default value: 192.168.0.120) in the address box, and press Enter.

The login page is displayed, as shown in Figure 5-1.

Figure 5-1 Login page

Input the Username and password.

NOTE

The default name is **admin.** The default password is **admin**. Change the password when you log in the system for first time to ensure system security.

You can change the system display language on the login page.

- Click Login.
- The main page is displayed.

Logout

To logout of system, click Sign out in the upper right corner of the main page, the login page is display after you log out of the system.

5.2 Main page layout

On the main page, you can view real-time video, set the sensor parameters, set the video parameters, video control, PTZ control, PTZ Configuration and log out of the system. Figure 5-2 shows the main page layout.

Figure 5-2 Main page layout

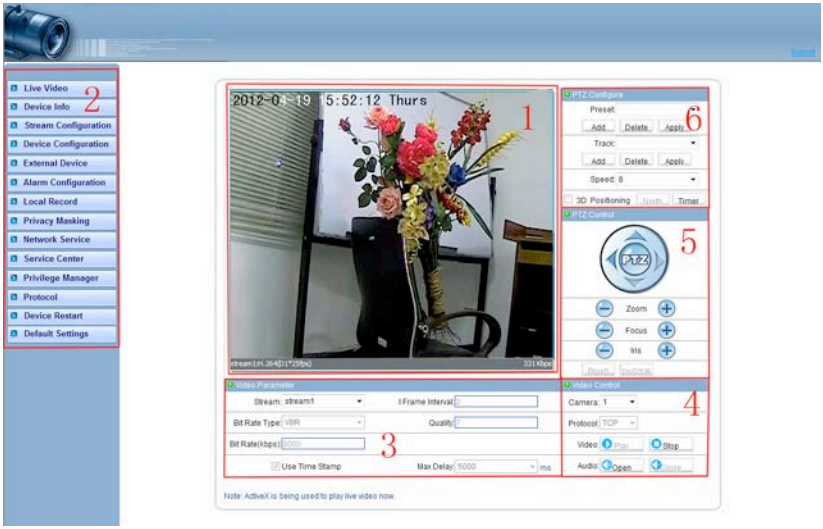


Table 5-1 Elements on the main page

NO.	Element	Description
1	Real-time video area	Real-time video is displayed in this area, You can also set sensor parameters.
2	Menu area	You can choose a menu to set the camera's parameters, including the camera information, audio and video streams, alarm setting, and privacy mask function.
3	Video area	Video parameters, such as the I frame interval, bit rate type, bit rate, and quality are displayed.
4	Video control area	You can perform the following operations in this area: • Switch between cameras. • Start or stop playing Videos. • Start or stop playing audio. • Enable or disable the intercom function
5	PTZ control	You can control the camera's direction, zoom in or

NO.	Element	Description
		out, and change the focal length and aperture for a dome camera. **NOTE** Currently the automatic aperture adjustment function is not supported.
6	PTZ configuration area	You can perform the following operations in this area: • Add, delete, and invoke the presents and tacks. • Adjust the PTZ rotation speed. • Enable or disable 3D position. • Set the direction to due north. • Set the PTZ timer. **NOTE** • PTZ timer function as a time trigger. When it is activated, the PTZ rotates according to presents and tracks as scheduled. • The PTZ timer uses the time set in camera. Ensure the time is correct.

5.3 Browsing Video

User can browse the real-time video in the web management system.

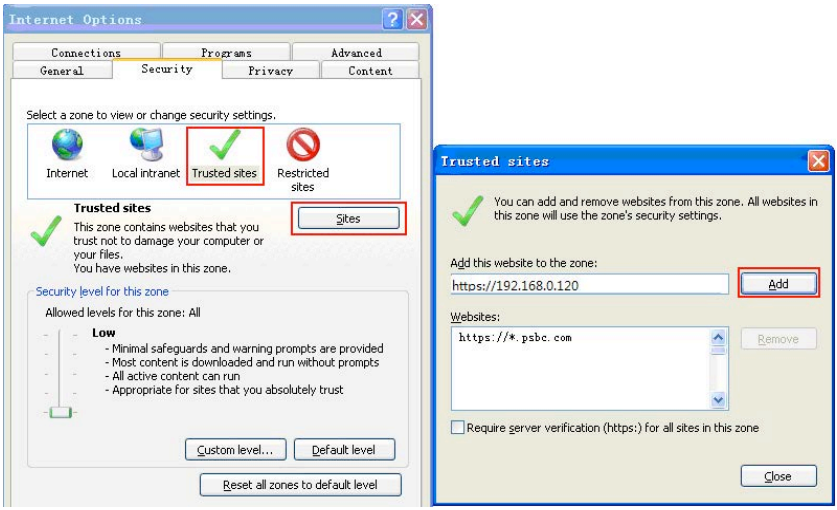
Preparation

To ensure the real-time video can be played correctly, you must perform the following operation when you log into the web for the first time:

Open the Internet Explorer. **Choose Tools > Internet options > Security > Trusted sites > Sites.**

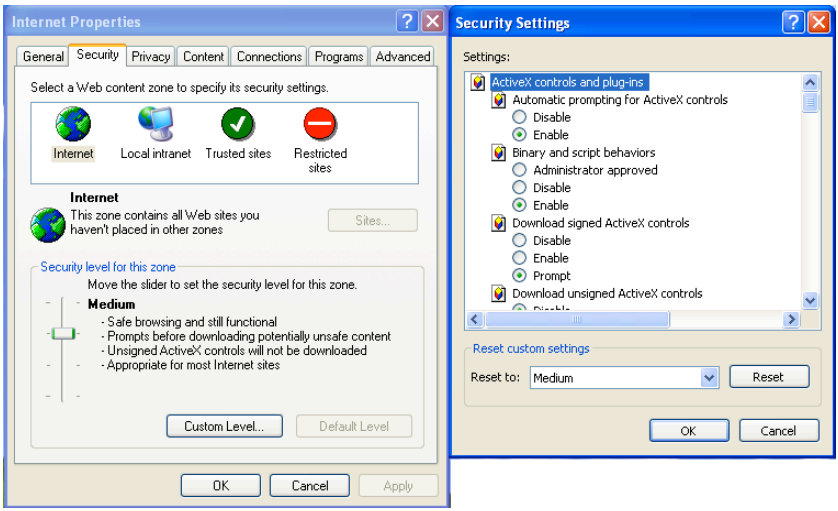
In the display dialog box, click **Add**, as shown in Figure 5-3.

Figure 5-3 Adding the a trusted site



In the Internet Explorer, choose Tool > Internet Options > Security > Customer level, then set Download unsigned ActiveX control, initialize and script ActiveX controls not marked as safe for scripting under ActiveX controls and plug-ins to Enable, as shown in Figure 5-4.

Figure 5-4 Configuring ActiveX control and plug-ins



Download and install the player control as prompted.

NOTE

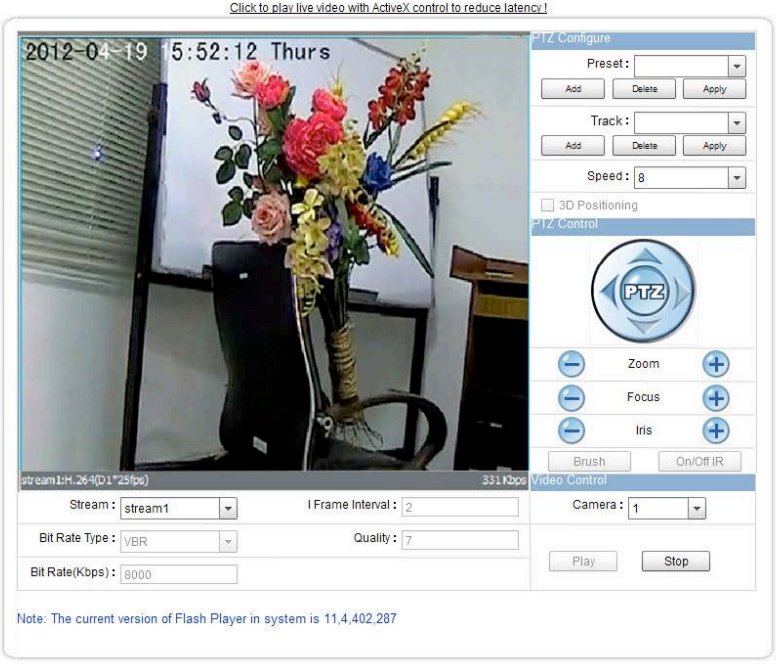
The login page is display when the control is loaded.

Download the right control in the Internet Explorer

Preparation

- Use Internet Explorer to browse video.
- Real-time video page pop-ups the message "clicks to play live video with ActiveX control to reduce latency" as shown in Figure 5-5.

Figure 5-5 Change the ActiveX



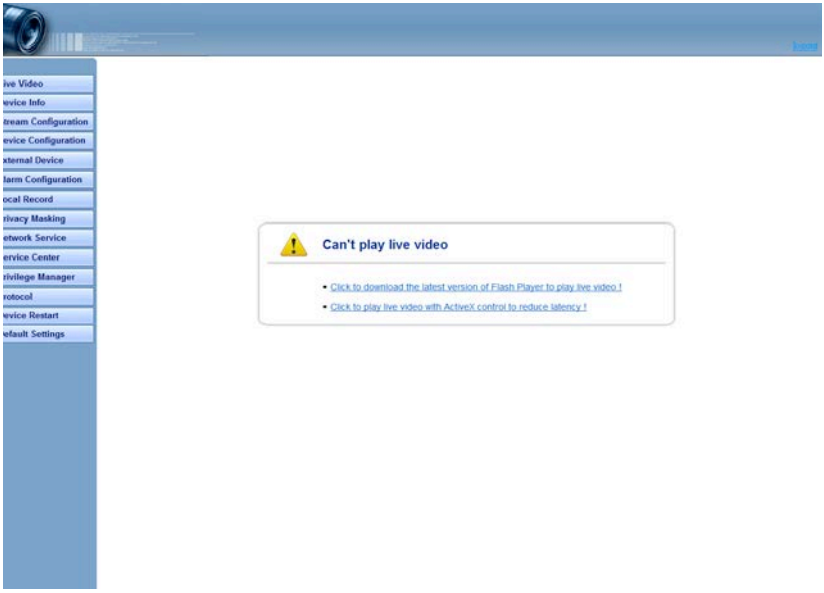
Click the message, jump to download ActiveX control interface, once downloading is complete, you can watch more fluent video screen.

Unable to display video picture, and need to download and install the control

Preparation

- Use Internet Explorer to browse video.
- Real-time video page pop-up the message "click to download the latest version of Flash Play live video" and "click to play video with ActiveX control to reduce latency" as shown in Figure 5-6.

Figure 5-6 Download control tips



Click the message" click to play live video with ActiveX control to reduce latency", download Adobe Flash Player Plugin control interface, once downloading is complete, you can watch video screen.

Click the message "click to download the latest version of Flash Play live video", download ActiveX control interface, once downloading is complete, you can watch more fluent video screen.

In Google Chrome, Mozilla Firefox, or Safari browsers

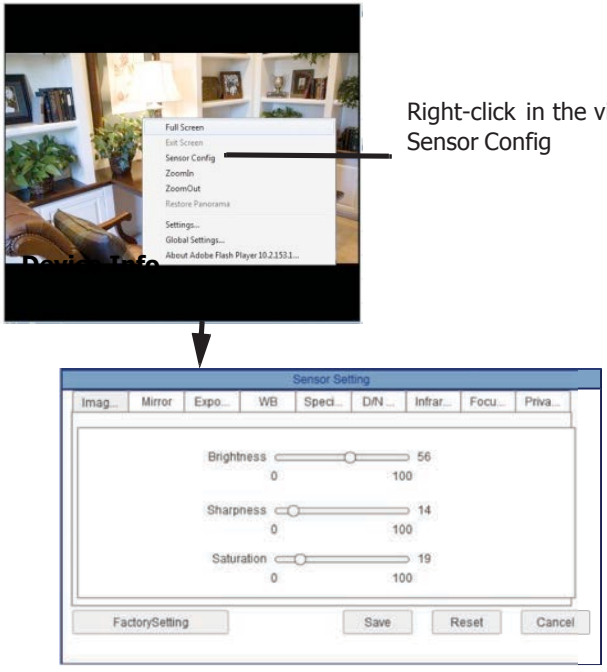
Google, Firefox, and Safari browsers only support Adobe Flash Player Plugin to play video. When Adobe Flash Plugin control version is too low, browser will automatically clew you to download the latest control.

5.4 Sensor Configuration

The Sensor Configuration menu is used to adjust camera image settings.

To configure camera image settings using the Sensor Configuration menu:

- Log into the camera using a web browser, and from the Live Video page, right-click on the video area and select **Sensor Config**.



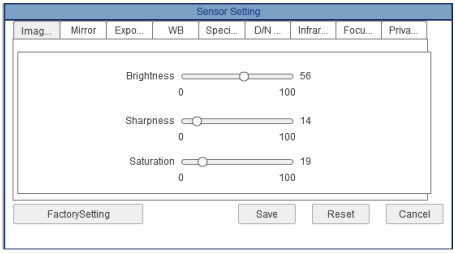
Right-click in the video area and select Sensor Config

Click **Save** to save setting changes.

- Click **Reset** to revert to the last saved changes.
- Click **Factory Setting** to revert all camera sensor settings to factory defaults.
- Click **Cancel** to exit.

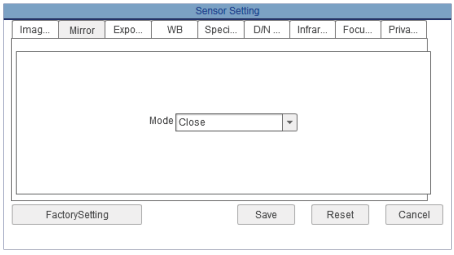
TIP: Hold the mouse over the tabs to see the full name of the tab.

Image Adjust



Adjust the Brightness, Saturation, and Contrast settings for the image.

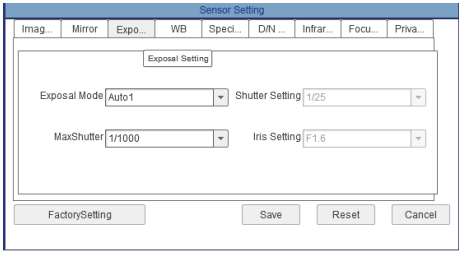
Mirror



Enable/disable image mirroring.

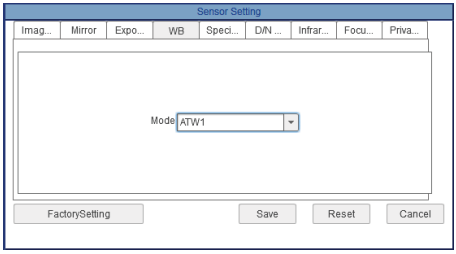
- **Mirror:** Select **Horizontal** to mirror the image horizontally, **Vertical** to mirror vertically, or **Picture Flip** to mirror both horizontally and vertically. Select **Close** to disable image mirroring.

Exposure



Adjust the exposure mode, shutter setting, max shutter speed and iris setting. Exposure mode can be set to **Auto 1**, **Auto 2**, **Shutter Priority** or **Iris Priority**. Shutter settings can be set between **1/25** and **1/10000**. Max Shutter can be set between **1/25** and **1/1000**. Iris setting can be set between **F1.6** and **F14**.

WB Setting

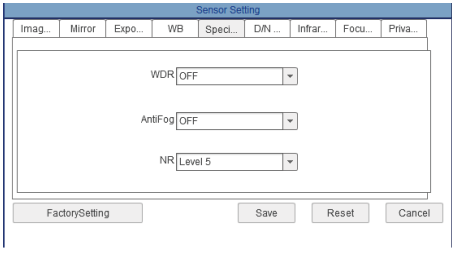


Adjust White Balance.

WB Mode: Select **Auto** for automatic white balance or **Manual** to manually set the white balance.

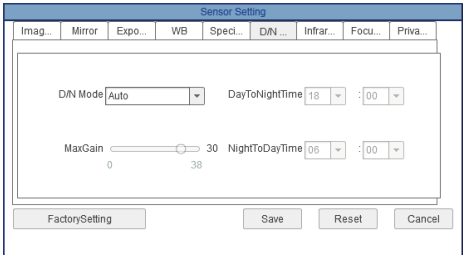
- **Manual Mode:** Select a mode for the lighting conditions or select **Customized** and manually adjust the **Red Gain** and **Blue Gain**.

Special Function



Adjust the WDR, Anti-fog and NR functions. WDR can be set to **On** or **Off**. Anti-fog can be set to **On** or **Off**. NR can be set to **Off**, **Level 1**, **2**, **3**, **4**, or **5** and **Auto**.

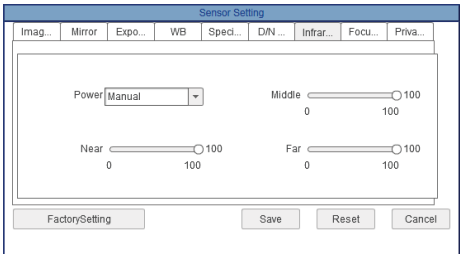
Day/Night Mode



Configure color settings for night mode.

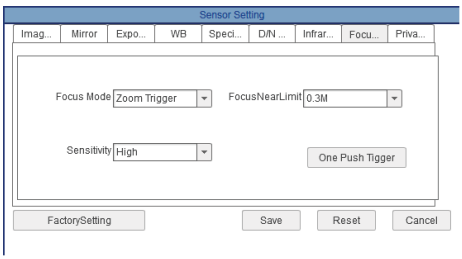
Night Color: Select **Auto, Day Mode**, **Night Mode** and **Timer** to have the camera switch to black and white during night mode. Set the **day to night time** and **night to day time** if **Timer** mode has been chosen.

Infrared



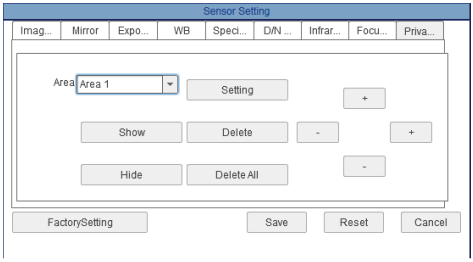
Configure the power setting of the Infrared LEDs. Select either **Auto** or **Manual**. When set to **Manual** mode the power of the IR LEDs can be adjusted at **Near**, **Middle**, and **Far**.

Focus



Configure the focusing settings for the camera. The **Focus Mode**, **Focus Near Limit** and **Sensitivity** can be adjusted. **One Push Trigger** with automatically focus the camera.

Privacy



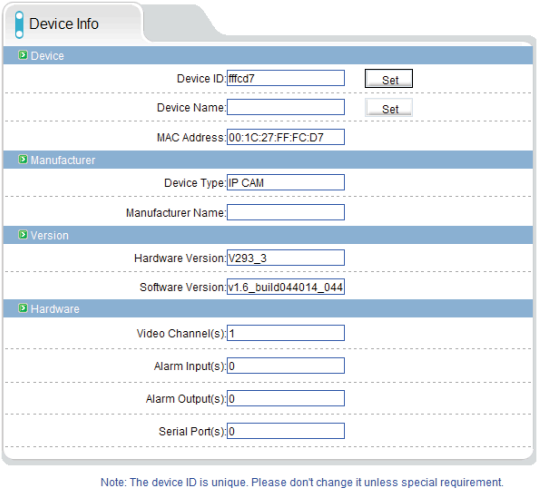
Configure the Privacy Area for the camera, you can choose up to 8 Privacy Areas.

5.5 Device Info

Description

The Device Info page shows information about your IP camera, such as the Device Name (which appears in the Device List in HD-IP), firmware version, MAC address, and camera inputs and outputs. You can also configure the Device Name for your camera shown in Figure 5-7

Figure 5-7 Device Info



Procedure

ATTENTION: The device ID is unique. Do not change it unless your installation has special requirements.

To configure the Device Name:

- Click Device Info
- Under Device Name, enter the disered device name and then click **Set**

5.6 Device Configuration

5.6.1 Local Network

Description

Local network parameters include:

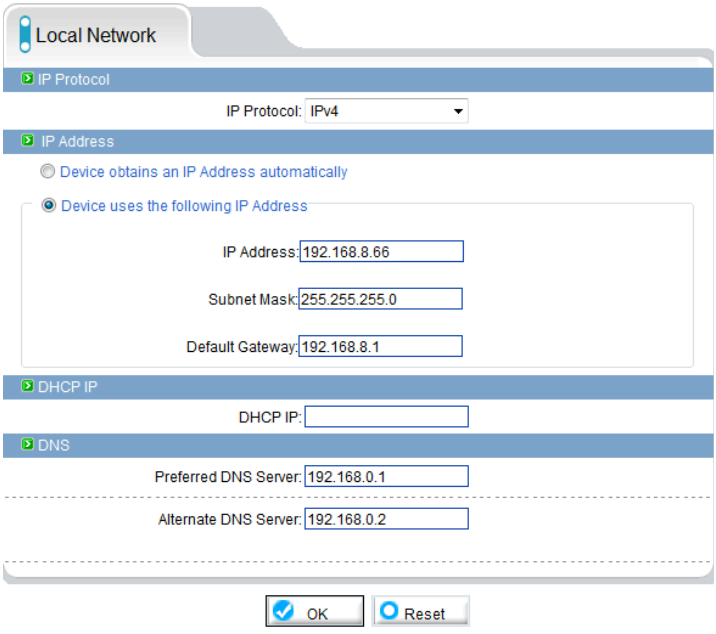
- IP protocol
- IP address
- Subnet mask
- Default gateway
- Dynamic Host Configuration Protocol (DHCP)
- Preferred Domain Name System (DNS) server
- Alternate DNS server

Procedure

Choose **Device Configuration** > **Local Network**.

The **Local Network** page is displayed, as shown in Figure 5-8

Figure 5-8 Local Network page



Set the parameters according to Table 5-2.

Table 5-2 Local network parameters

Parameter	Description	Setting
IP Protocol	IPv4 is the IP protocol that uses an address length of 32 bits.	[Setting method] Select a value from the drop-down list box. [Default value] IPv4
Camera obtain an IP address automatically	The camera automatically obtains the IP address from the DHCP server.	[Setting method] Click the option button. **NOTE** To query the current IP address of the camera, you must query it on the platform based on the camera name.

Parameter	Description	Setting
IP Address	Camera IP address that can be set as required.	[Setting method] Enter a value manually. [Default value] 192.168.0.120
Subnet Mask	Subnet mask of the network adapter.	[Setting method] Enter a value manually. [Default value] 255.255.255.0
Default Gateway	This parameter must be set if the client accesses the camera through a gateway.	[Setting method] Enter a value manually. [Default value] 192.168.0.1
Preferred DNS Server	IP address of a DNS server.	[Setting method] Enter a value manually. [Default value] 192.168.0.1
Alternate DNS Server	IP address of a domain server. If the preferred DNS server is faulty, the camera uses the alternate DNS server to resolve domain names.	[Setting method] Enter a value manually. [Default value] 192.168.0.2

- Click **OK**.
- If the message "Network Parameter Updated" is displayed, click OK. The system saves the settings. The message "Set network parameters success, Please login system again" is displayed. Use the new IP address to log in to the web management system.
- If the message "Invalid IP Address", "Invalid Subnet Mask", "Invalid default gateway", "Invalid primary DNS", or "Invalid space DNS" is displayed, then set the parameters correctly.

NOTE

If you only set the **Subnet Mask**, **Default Gateway**, **Preferred DNS Server**, and **Alternate DNS Server** parameters, you do not need to log in to the system again.

You can click **Reset** to set the parameters again if required.

5.6.2 Device Port

Description

The Device Port (Device Configuration > Device Port) allows you to configure the camera's ports The camera has the following ports:

- Control Port: The default is 30001. It enables video streaming
- HTTP Port: The default is 80. It enables web access.
- RTSP Port: Default is 554. Only used for special applications requiring RTSP streaming, such as VLC player or quick time player.
- RTMP Port: Default is 8080. Only used for special applications

Note: If you are configuring multiple IP cameras for individual remote access (without an NVR or server), you must change all the ports for each camera. Two cameras cannot use the same port number.

Procedure

To change the camera ports:

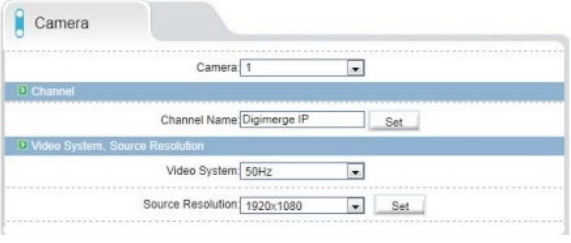
- Click **Device Configuration > Device Port**
- Configure the camera ports s required and then click **OK**

5.6.3 Camera

Description

The camera page (Device Configuration > Camera) allows you to configure the Channel Name, which appears on the camera OSD and the video system frequency shown in Figure 5-9.

Figure 5-9 Camera



Procedure

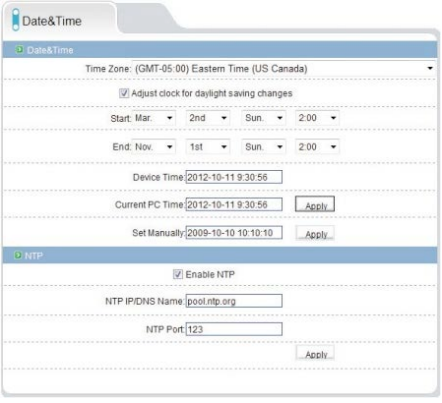
- To change the Channel Name, configure it as needed and then click the **Set** button next to the Channel Name
- To change the Video System Frequency, select the desired setting under video system and then click the **Set** button.

5.6.4 Date & Time

Description

The Date and Time page allows you to configure the camera's date and time, shown in Figure 5-10

Figure 5-10 Date and Time



Procedure

You can set the camera's date and time in the following ways:

- Using a NTP server (recommended)
- Using your computer's system time
- Manually

The camera is configured to use NTP by default, but you must set the time zone and daylight savings time settings to ensure an accurate time. After a power failure, the camera is configured to connect to an NTP server and automatically update the time when power is restored. If using another method to set the camera clock. time

To set the camera's date and time using an NTP server:

- Click **Device Configuration > Date & Time**.
- Under **Time Zone**, select your time zone.
- If your region observes daylight savings time, check **Adjust clock for daylight saving changes**.
  - Under **Start** and **End**, select the start and end times for daylight savings.
- Insert the NTP IP address/DNS name and NTP port of the NTP server.
- Click **Apply**.

To sync the camera's date and time to your computer's system time:

- Click **Device Configuration > Date & Time**.
- Un-check **Enable NTP** and click **Apply** at the bottom of the screen.
- Under **Time Zone**, select your time zone.
- If your region observes daylight savings time, check **Adjust clock for daylight saving changes**.
  - Under **Start** and **End**, select the start and end times for daylight savings.
- Click **Apply** next to Current Computer Time. The current device time updates.

To set the camera's date and time manually:

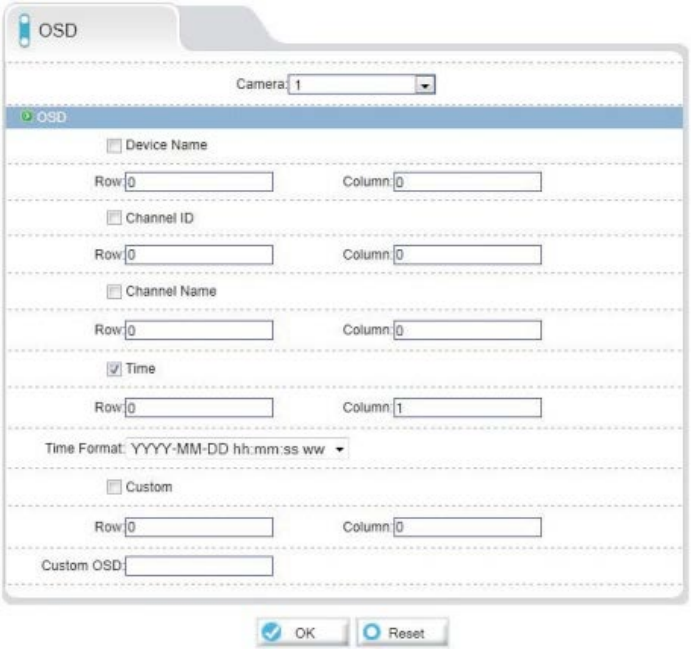
- Click **Device Configuration > Date & Time**.
- Under **Time Zone**, select your time zone
- Un-check **Enable NTP** and click **Apply** at the bottom of the screen.
- If your region observes daylight savings time, check **Adjust clock for daylight saving changes**.
  - Under **Start** and **End**, select the start and end times for daylight savings.
- Click **Set manually**, and use the on-screen calendar to set the time and date.
- Click **Apply**. The camera updates to the newly entered time.

5.6.5 OSD

Description

The OSD page allows you to configure the camera's on-screen display text, shown in Figure 5-11.

Figure 5-11 OSD

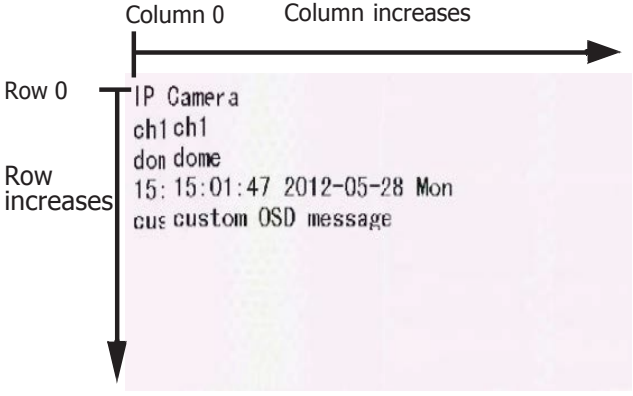


Procedure

To configure the cameras OSD:

- Click Device Configuration > OSD.
- Check the following options to enable OSD text:
- **Device Name:** Display the Device Name.
- **Channel ID:** Show the channel ID number.
- **Channel Name:** Show the name of the channel set in the Camera menu.
- **Time:** Show the date and time on the OSD. Select the desired date and time format under **Time Format**.
- **Custom:** Create a custom OSD message. Enter the custom OSD text under **Custom OSD**.

Enter the desired **Row** and **Column** for enabled OSD messages. Text on row 0 is shown at the top of the screen, and moves down as the row number increases. Text on column 0 is shown on the left side of the screen, and moves right as the column number increases.



Click **OK** to update the camera OSD.

5.6.6 Microphone

Description

Configure microphone settings for audio. Self-powered microphone required (not included), shown in Figure 5-12.

Figure 5-12

Procedure

To configure microphone settings:

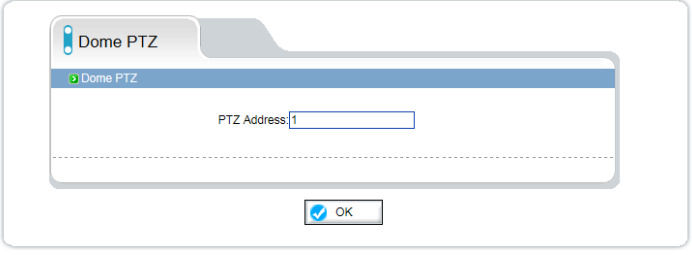
- Click Device Configuration > Microphone.
- Check **Enable Microphone** to enable the microphone or un-check to
- disable.
- Under **Microphone Volume**, select the volume for the microphone between **1~100**.
- Click **OK** to save changes.

5.6.7 Dome PTZ

Description

Configure the PTZ address, shown in Figure 5-13

Figure 5-13



Procedure

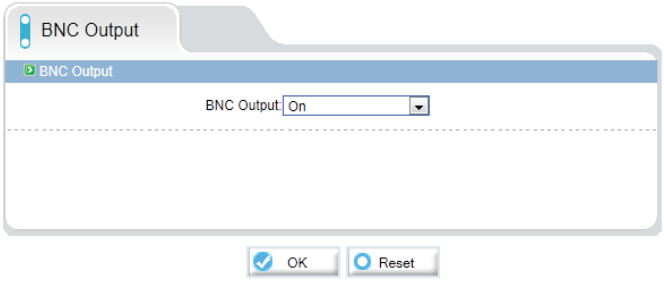
Click the text box to change the ID of the camera and then click **OK**.

5.6.8 CVBS Configuration/BNC Output

Description

To turn the BNC output on or off, shown in Figure 5-14

Figure 5-14



Procedure

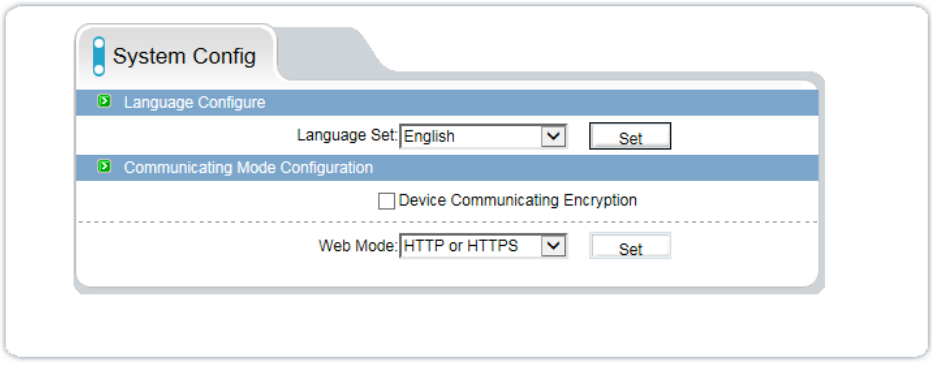
Under BNC Output (**Device Configuration > BNC Output**), select **on** to enable analog output or **off** to disable and click **OK**.

5.6.9 System Configuration

Description

Change the language for the camera OSD display (e.g. time and date display) and email alarms. Supported languages are English, Polish, Russian, and Chinese. You can also change the web mode from HTTP and HTTPS, shown in Figure 5-15

Figure 4-15 System Configuration



Procedure

To change the language for the OSD and email alarms:

- Click Device Configuration > Language.
- Under **Language**, select the desired language then click **OK** to save changes.

To change the Web mode for the camera:

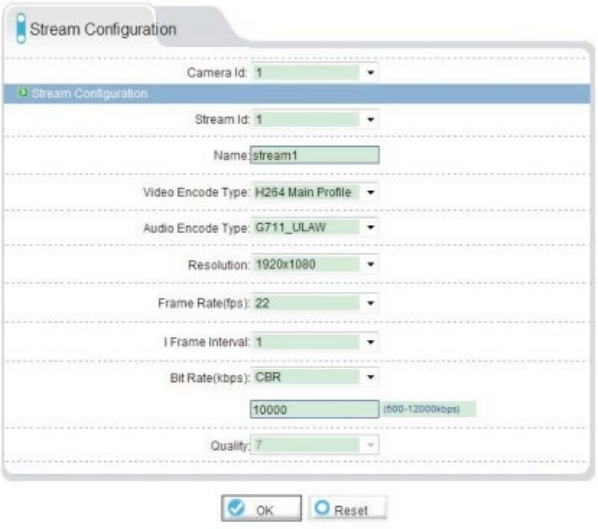
- Click on the tick box to enable the Device Communication Encryption.
- Click the drop down box on the web mode.
- Select ether HTTP, HTTP and HTTPS or HTTPS then click on SET.

6. Stream Configuration

Description

The stream configuration page allows you to configure the camera's video streams. The camera supports two streams. This allows you to have a high quality recording stream (stream 1) and a lower quality stream (stream 2) to preserve bandwidth for remote connections shown in Figure 6-1.

Figure 6-1 Stream Configuration



Procedure

To configure the video stream settings:

Click **Stream Configuration.** Under **Stream ID**, select the stream you would like to configure.

Configure the following according to Table 6-1.

Table 6-1 Stream configuration

Parameter	Description	Setting
Video Encode Type	Set the video encoding type for the stream	[Setting method] Click on the dropdown box: H.264 High Profile, H.264 Main Profile, H.264 Base Profile, MJPEG
Audio Encode Type	Set the audio encode type for the stream	[Setting method] Click on the dropdown box: G711_ALAW, G711_ULAW, RAW_PCM, None
Resolution	Select the resolution for the stream	[Setting method] Stream 1: 1920 x 1080, 640 x 360 Stream 2: D1, 640 x 480,640 x 360, CIF, QCIF, 320 x 240
Frame Rate	Select the frame rate for the stream.	[Setting method] 1 – 25 for both streams
I Frame Interval	Select the I frame interval	[Setting method] 1 - 75
Bit Rate	Set the CBR (Constant Bit Rate) or VBR (Variable Bit Rate) for stream 1 and 2	[Setting method] CBR 500-12000 kbps
Quality	Select the video quality	[Setting method] 1 (lowest) and 9 (highest)

7. Alarm Configuration

Alarm configuration contains the following sub menus:

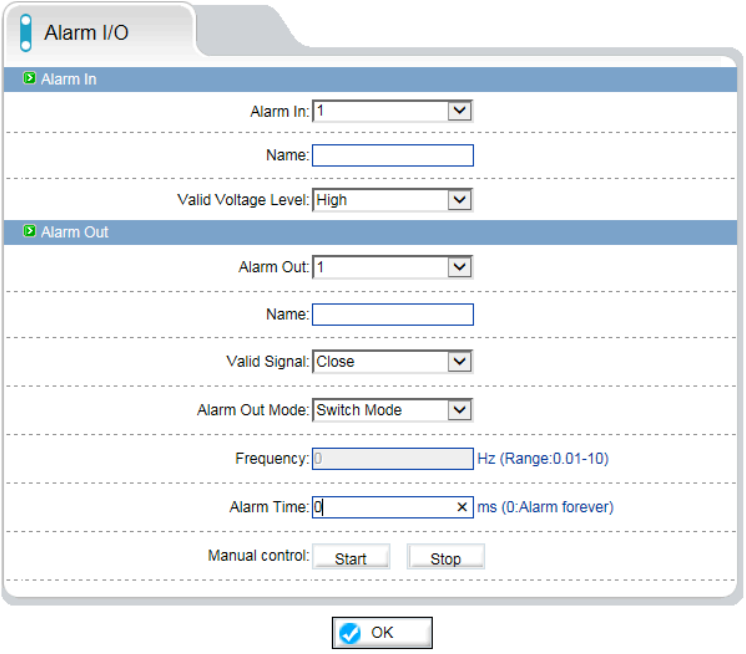
- Alarm I/O
- Disk Alarm
- Network Alarm
- I/O Alarm
- Motion Alarm

7.1 Alarm I/O

Description

The Alarm I/O page allows you to configure the alarms. It lets you configure the names of the alarms, and alarm modes, shown in Figure 7-1.

Figure 7-1 Alarm I/O



Procedure

To configure the alarm I/O:

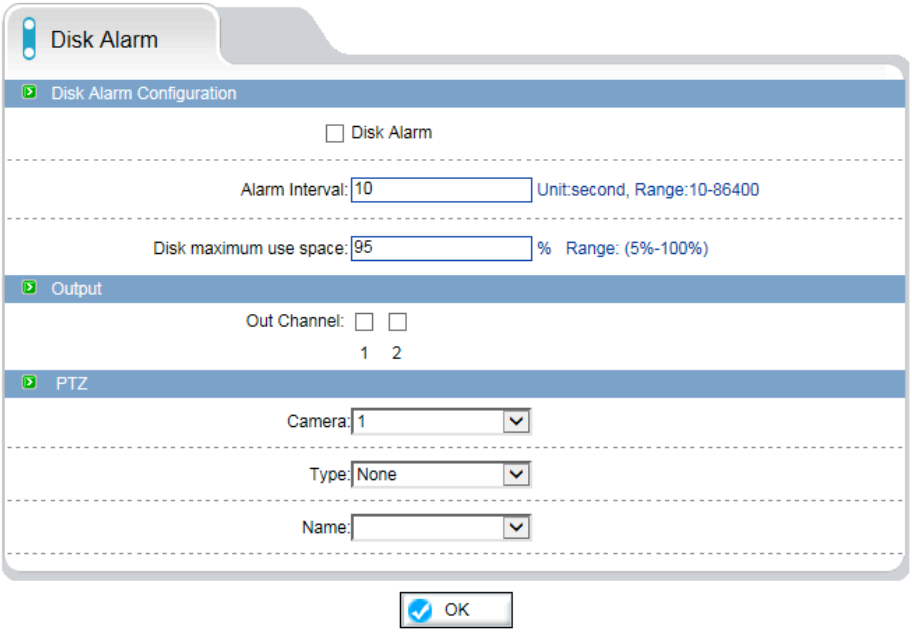
- Choose which **Alarm In** you would like to configure.
- Name that Alarm In
- Choose a Voltage Level either **High** or **Low**
- Choose which **Alarm Out** you would like to configure
- Name that Alarm Out
- Choose which is a Valid Signal either **Open** or **Close.**
- Choose the Alarm Out Switch mode either **Pulse** or **Switch.**
- Choose the Frequency if the switch is on Pulse Mode.
- Set the **Alarm Time**.
- Use Manual Control, **Start** or **Stop** if needed.
- Click **OK** once finished.

7.2 Disk Alarm

Description

The Disk Alarm page allows you to configure alarms if there is an issue with the recording disk. You can configure a Disk Full Alarm or a Disk Error Alarm. A Disk Full Alarm triggers an alarm when the recording disk is full or exceeds a certain percentage. A Disk Error Alarm triggers an alarm if there is an error accessing or writing to the recording disk, shown in Figure 7-2.

Figure 7-2 Disk Alarm



Procedure

To configure Disk Alarms:

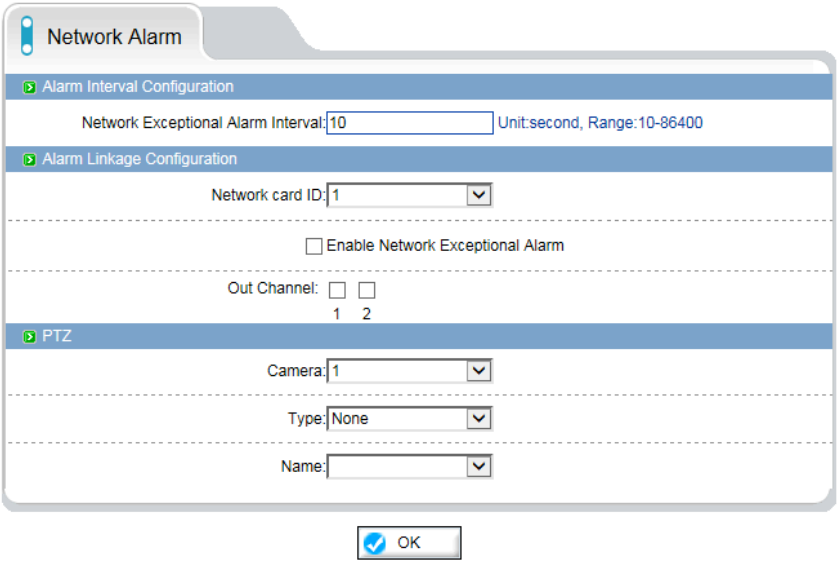
- Click **Alarm Configuration > Disk Alarm**.
- Check **Disk Full Alarm** to enable Disk Full Alarms.
- Under **Max Disk Space**, enter the disk full percentage that will trigger an alarm (e.g. a Disk Full Alarm will be triggered when the recording disk is 80% full).
- Select an alarm output if desired
- Click the dropdown box where is says **Type** and select either preset or track.
- Click the dropdown box where is says **Name** and select which preset or track you want to use.
- Click **OK**.

7.3 Network Alarm

Description

The network alarm allows you to set an alarm when the camera is disconnected from the network. You can also set it to go to a preset position or a track, shown in figure 7-3.

Figure 7-3 Network Alarm



Procedure

To configure the Network Alarm:

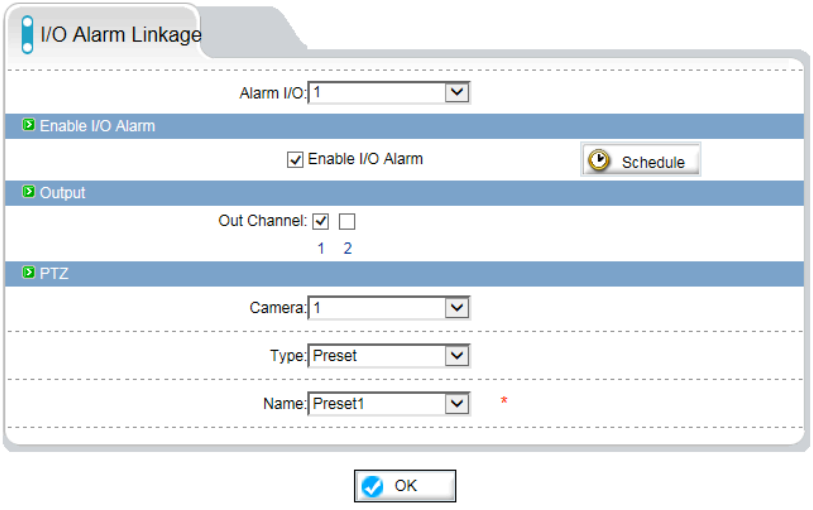
- Set the Network Exceptional Alarm Interval. (Between 10 seconds and 24 hours) Units are in seconds.
- Enable the Network Exceptional Alarm
- Choose an **Alarm Output**
- Choose either a **Preset** or **Track** from the drop down box you would like to trigger if an alarm activates.
- Choose which **Preset** or **Track** you would like to use.
- Click **OK** once you have finished.

7.4 I/O Alarm Linkage

Description

The I/O Alarm Linkage allows you to configure the alarm inputs and choose if it activates a preset, track and alarm output, shown in Figure 7-4.

Figure 7-4 I/O Alarm Linkage



Procedure

To configure the I/O Alarm Linkage:

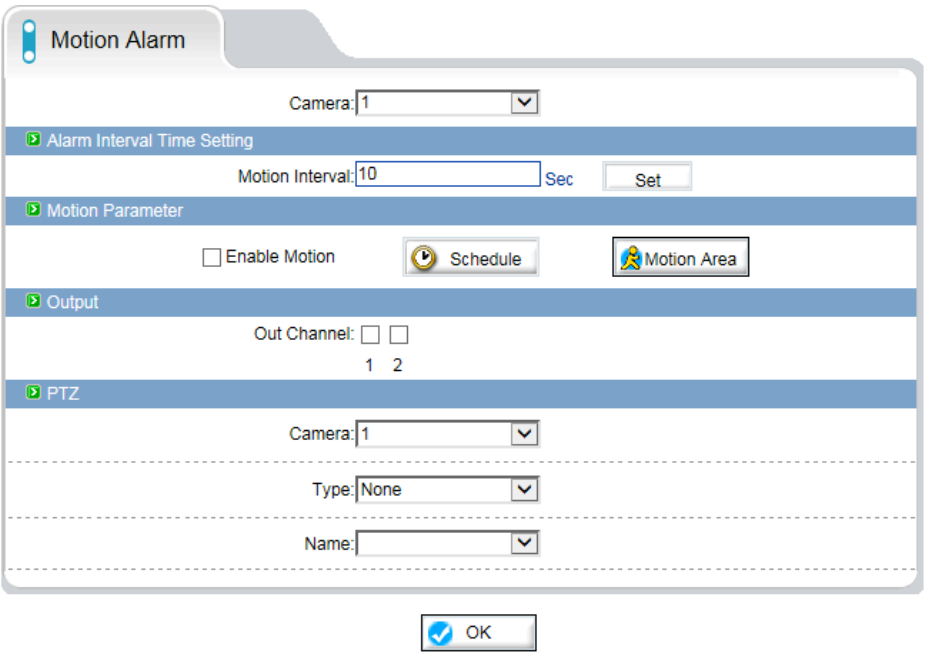
- Choose which **Alarm In** you would like to configure.
- Enable the Alarm In and set the schedule, see Motion Detection for more information about the schedule.
- Choose an **Alarm Output**
- Choose either a **Preset** or **Track** from the drop down box you would like to trigger if an alarm activates.
- Choose which **Preset** or **Track** you would like to use.
- Click **OK** once you have finished.

7.5 Motion Alarm

Description

The Motion alarm page allows you to configure camera motion detection alarm settings, shown in Figure 7-5.

Figure 7-5 Motion Alarm



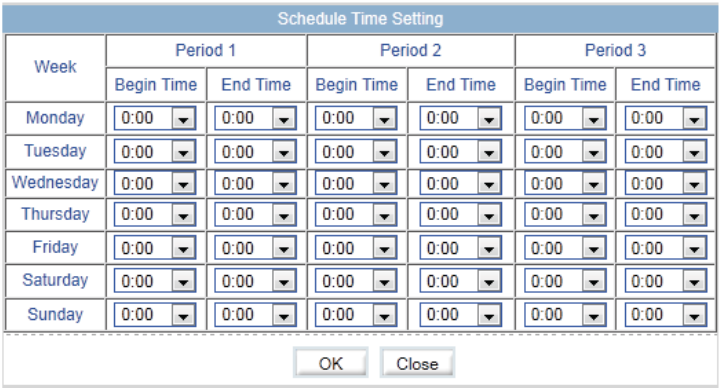
Procedure

To configure motion detection:

- Click **Alarm Configuration > Motion Alarm**.
- Check **Enable** under **Motion Parameter**.
- Click **Schedule** to configure a motion detection schedule. The Schedule
- Time Setting menu opens, shown in Figure 7-5

NOTE: If the Schedule Time Setting does not open, disable any popup blockers.

Figure 7-5 Schedule Time Setting

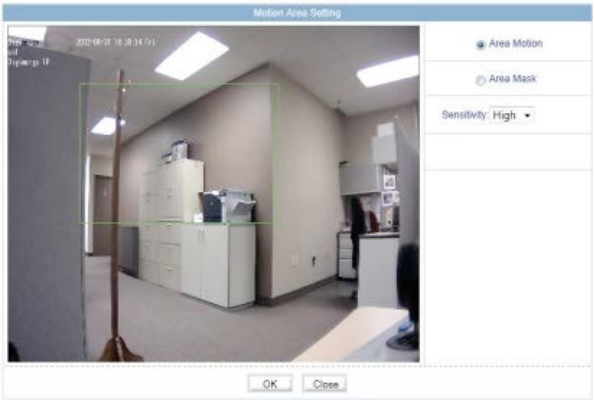


Configure the weekly schedule. The schedule is divided into 3 periods, and motion detection will be enabled in all times during all 3 periods.

Click **Motion Area**, and configure up to 8 motion detection areas, shown in Figure 7-6:

- Select **Area Motion** or **Area Mask** to configure motion detection areas.
- Area Motion allows you to select areas where motion detection is enabled.
- Area Mask enables the entire image for motion detection, and allows you to select areas to disable motion detection.
- Right-click to delete the last created area.
- Under **Sensitivity**, select the sensitivity for motion detection: **Low**, **Medium**, or **High**.

Figure 7-6 Motion Area



Click **OK** to save your settings.

8. Local Record

Local Record contains the following sub-menus:

- Record Policy
- Record Directory

8.1 Record Policy

The Record Policy menu allows you to set the NAS and FTP recording parameters. Once configured, the device can record video directly to the NAS and FTP.

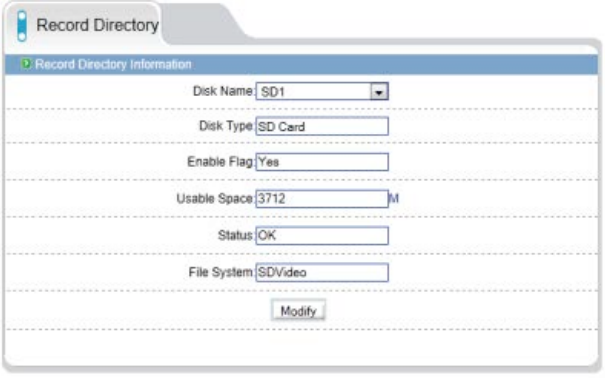
To enable recording to the NAS/FTP:

- Click **Local Record > Record Policy**.
- Configure recording storage locations in the Record Directory sub-menu.
  NOTE: The camera will simultaneously record to all storage locations that have been enabled in Record Directory.
- To enable scheduled or continuous recording, check **Enable** under Schedule Record. Select **7*24 H Record** to record video continuously at all times, or, select **Schedule Record** to create a schedule for recording.
- If you select Schedule Record, click **Schedule** and configure recording times. The schedule is divided into 3 periods, and the camera will record during all selected times in all 3 periods. Click **OK** when finished configuring the recording schedule.

- To enable Motion Alarm Recording, check **Enable** under **Alarm Record**.
- Configure **Pre-recording** and **Post-recording** times. Check **Motion**
- **Alarm, Channel**.
- Under **Stream**, select the stream to use for recording. Stream 1 is recommended if you want to record high quality video, stream 2 is recommended if you want to save bandwidth or storage space.
- Check **Record Audio** to enable audio recording.
- Under **Storage Rule**, select **Cycle Write** to enable the camera to overwrite the oldest recorded data once the available space in the storage location is filled. Or, select **Save Days** to save video for a set number of days and enter the **Number of Days** desired. Note that you must have sufficient storage space to save the number of days entered.
- Click **OK** to save changes.

NOTE: To view video from the FTP or NAS, use HD-IP's playback features, see the HD-IP manual on the USB stick for details. You can access video saved to FTP or NAS by manually accessing your FTP server or NAS device.

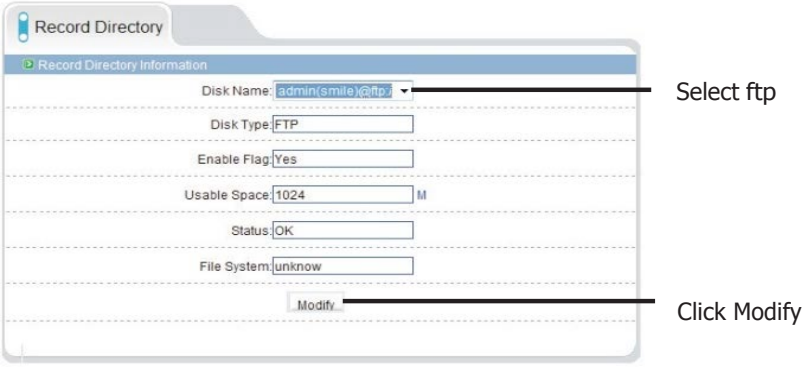
8.2 Record Directory



Record Directory allows you to configure NAS and FTP storage locations

To configure FTP storage location:

- Click **Local Record > Record Directory**.
- Under **Disk Name**, select **ftp**.



Click **Modify**. The Record Disk Path opens.

- Check **Enable**.
- Configure the following:

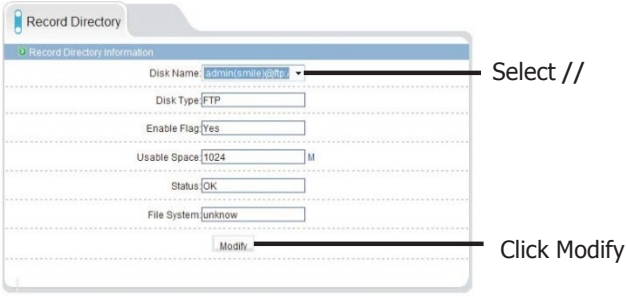
  - **IP:** Enter the FTP server address.
  - **Port:** Enter the FTP port number.
  - **Accounts:** Enter the FTP account user name.
  - **Password / Confirm Password:** Enter the FTP password.
  - **Free Space:** Enter the amount of space (in MB) you would like to make available on the FTP server for recording.
- Click **OK**.
- Set up recording using the Record Policy sub-menu. To access your recordings, use HD-IP or manually access your FTP server.

NOTE: On the Record Directory page, Status will be OK when FTP is selected if FTP is accessible and all settings have been entered correctly.

Status OK

To configure a NAS storage location:

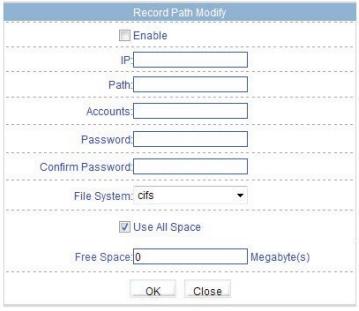
- Click **Local Record > Record Directory**.
- Under **Disk Name**, select **//**.



Select //

Click Modify

- Click **Modify**. The Record Disk Path menu opens.
- Configure the following:



  - **IP:** Enter the IP address of the NAS.
  - **Path:** Enter the NAS folder where video files will be saved. NAS folder must be located directly under the root folder of the NAS (e.g. /public).
  - **Accounts:** Enter the account user name for the NAS.
  - **Password/Confirm Password:** Enter the account password for the NAS.

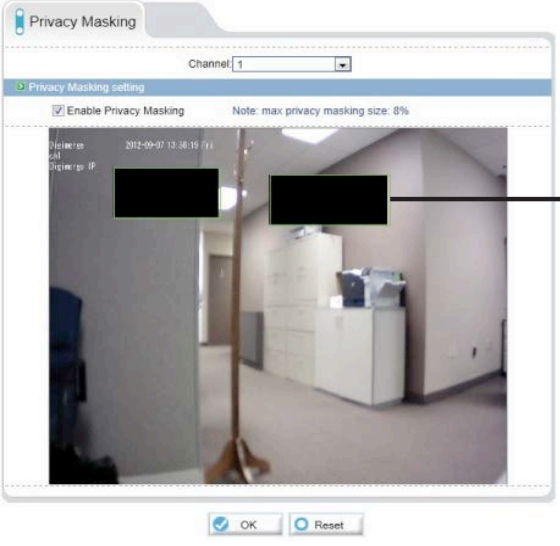
- **File System:** Enter the NAS file system (**cifs** or **nfs**).
- **Use All Space:** Check to enable the camera to record until the NAS is full. Uncheck to limit the amount of space the camera can record on and enter the amount of space (in MB) available to the camera under **Free Space**.

- Click **OK**.
- Set up recording using the Record Policy sub-menu
- To access your recordings, use HD-IP or manually access your NAS device.

NOTE: On the Record Directory page, status will be OK when the NAS is selected if the NAS is accessible and all settings have been entered correctly..

Status OK

9. Privacy Masking



Privacy area

The Privacy Masking allows you to create privacy areas that will restrict you from viewing restricted areas.

To configure privacy areas:

Click Privacy Masking.

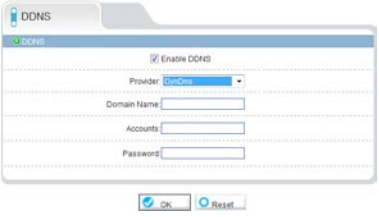
- Check **Enable Privacy Masking**.
- Click and drag inside the video area to configure privacy areas. Privacy areas will be shown as green rectangles. Right-click to delete the last created area.
- Click **OK**.

10. Network Service

Network Service contains the following sub-menus:

- DDNS

10.1 DDNS



- The DDNS sub-menu allows you to configure DDNS settings. Before configuring DDNS settings, the camera must be registered for a DDNS account.

To configure DDNS settings:

- Click **Network Service > DDNS**.
- Check **Enable DDNS**.
- Configure the following:
- **Provider:** Select **Dun DNS or 3322 DDNS services as required**.
- **Domain Name:** Enter the **Domain Name** for your registered account with either service. This forms part of the prefix name on the domain.

  NOTE: Connect to your camera using a web browser by entering **http://**, the **Domain Name**, **colon**, and then the **HTTP port**. For example, if the Domain Name is mycamera.dyndns.org, use the address http://mycamera.dyndns.org:80.

- **User Name:** Enter the **User Name** you registered with.

- **Password:** Enter the **Password** you have set on the account.
- Click **OK** to save settings.

11. Service Centre

Service Centre contains the following sub-menus:

- SMTP

11.1 SMTP (Email Alert Setup)

The SMTP sub-menu allows you to configure email alerts when motion alarms occur. Email alerts will include a .jpg snapshot attachments.

Before setting up email alerts it will need configuring. Please do the following:

- Motion alarms must be enabled before the camera will send email alerts.
- A static IP address must be configured for the camera and DNS servers must be entered.

To enable email alerts:

- Click **Service Center > SMTP**.
- Check **Enable SMTP**.
- Configure the following:
  - **SMTP Server Address:** Enter the address for your SMTP server.
  - **SMTP Server Port:** Enter your server's SMTP port number.
  - **User Name:** Enter the SMTP account user name.
  - **Password:** Enter the SMTP account password.

- **Sender E-mail Address:** Enter the email address that will be used to send email alerts.
- **Recipient E-mail Address 1~5:** Enter up to 5 email addresses that will receive email alerts.
- **Attachment Image Quality:** Select the quality of the image attachments:
- **High**, **Mid**, or **Low**.
- **Transport Mode:** Select the encryption type used by the server (**SSL** or **STARTTLS**) or select **No encrypted** if your server does not use encryption.

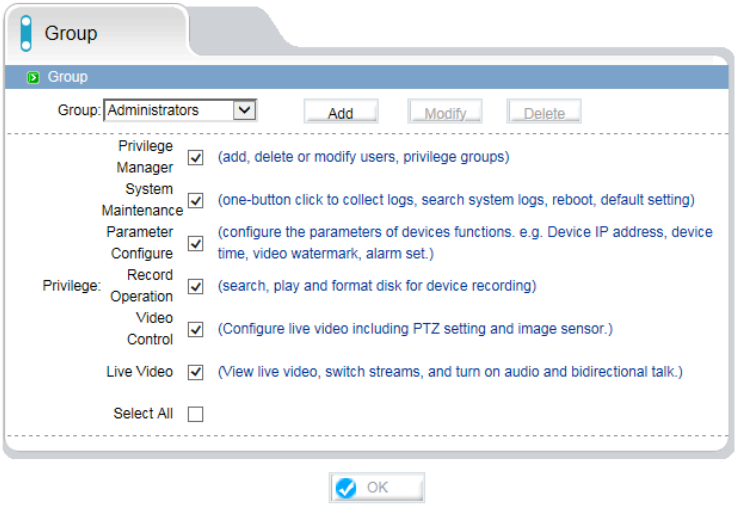
- Click **OK** to save your settings. Click **Send test mail** to send a test email alert.

12. Privilege Manager

Privilege Manager allows you to configure user accounts and user groups. Privilege Manager contains the following sub-menus:

- Group
- User

Group


Group
Group
Group: Administrators
Add
Modify
Delete
Privilege:
Privilege Manager
(add, delete or modify users, privilege groups)
System Maintenance
(one-button click to collect logs, search system logs, reboot, default setting)
Parameter Configure
(configure the parameters of devices functions. e.g. Device IP address, device time, video watermark, alarm set.)
Record Operation
(search, play and format disk for device recording)
Video Control
(Configure live video including PTZ setting and image sensor.)
Live Video
(View live video, switch streams, and turn on audio and bidirectional talk.)
Select All
OK

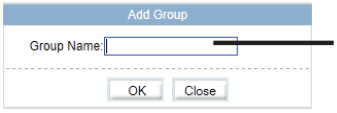
The Group page (**Privilege > Group**) allows you to manage permissions for user groups. Users obtain permissions from their group. The Administrators group contains all permissions and cannot be deleted or edited.

To add a user group:

- Click **Add**. The Add Group menu appears.

NOTE: If the Add Group menu does not appear, disable any popup blockers.

- Enter a name for the user group and click **OK**.

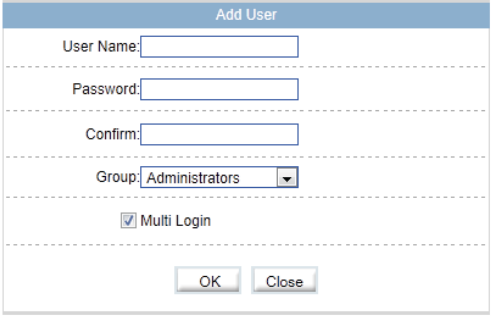


Enter a group name and click OK

To add a user account:

- Click **Add**. The Add User window appears.

NOTE: If the Add User menu does not appear, disable any popup blockers.



- Enter a **User Name** and **Password** for the account and repeat the password under **Confirm**.
- Under **Group**, select the desired user group for this account.
- Check **Multi Login** to allow the user account to log into the IP camera from multiple locations simultaneously or un-check to limit the account to a single location at a time.
- Click **OK** to save the new user account.

To modify a user account:

- Select the user account under **User** and click **Modify**.
- Modify the account details as needed and click **OK**.

To delete a user account:

- Under **User**, select the user account and click **Delete**. Click **OK** to confirm.

Unlocking User Accounts

The admin account is the only account that can unlock user accounts that have been locked out. User accounts are locked out if the wrong password is entered 3 or more times.

To unlock a user account:

- Login to the camera as admin.
- Click **Privilege Manager > User**

- Under **User**, select the locked user account.
- Click **Unlock** to unlock the account.

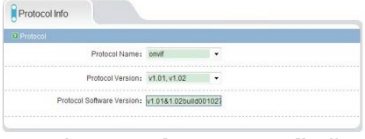
13. Protocol

Protocol contains the following sub-menus:

- Protocol

NOTE: Do not check User Verification in the Security sub-menu, as it may block ONVIF software from detecting the camera.

Protocol Info



The Protocol page (**Protocol > Protocol**) allows you to view ONVIF protocol settings.

14. Maintenance

Device Restart

Click **Device Restart**. Click **Restart** then click **OK** to restart the camera.

Default Settings

Click **Default Settings**. Click **Restore** then click **OK** to restore the camera to factory default settings. The camera will reboot.

15. Technical Specification

VHSDIR-870EXT-IP Technical Parameters

Parametres	Description
MODULE	
Sensor	1/2.8" CMOS Sensor
Max Res./ Max Frame Rate	1920x1080 30/25 fps
Synchronization	Internal
Focus	Auto/Manual
Zoom	22x Optical
Lens	4.7mm(wide) – 103mm(tele), F1.6 – F3.5
Minimum working distance	wide: 10mm tele: 800mm
S/N	50db
BLC	On/Off
Aperture	Auto/Manual
Electronic shutter	1/1 – 1/10000 Second, 22 levels
White Balance	Auto/Auto Tracking/Indoor/Outdoor/Manual
Gain	Automatic/manual,-3dB - 28dB, min 16
Wide dynamic	Auto/On/Off
Noise suppression	6 Levels
Sharpness	16
Day Night	True Day/Night with ICR Filter.
Min illumination	Filter off: 0.26 Lux; Filter on: 0.005 Lux
IR LED (IR Model)	12pcs High Powered Super Flux LEDs 850nm
IR Distance (IR Model)	100 Meters (330 feet) with Smart IR LED function.
Alarm In / Out	Seven Alarm Inputs/Two Alarm Output
Video Output	Service BNC Video Output
Control Method	Onvif/RS-485 (In/Out)

Horizontal angle of View	55°-2.9°
PTZ Speed	Pan 0.01°~360/s, Tilt 0.01°~360/s
Horizontal angle	360 degrees continuous
Vertical angle	0-93 degrees
Position-indicating	Support
3D positioning	Support
Coordinate direction	Support
RS485	PELCO-D, PELCO-P/Full-duplex
Preset	200 User Defined Positions 255 User Positions
Preset Speed	360 degrees/sec.
Preset accuracy	< 0.5 degrees
Pattern	6 Tracks
Tour	12 Guard Tours
VIDEO	
Compression	H-264 High Profile/Base Profile/Main Profile. Stream2 Support H-264 or MJPEG
Streaming	Stream1 Full Resolution, Stream2 VGA/D1/CIF or QCIF selectable
Quality Setting	VBR quality 1 - 9 values (9 Highest)/CBR fixed quality as bitrate
I Frame	User selection value
Image Overlay	Time, date, channel number, temperature, channel names and custom text
Brightness / Sharpness	Variable 0~100/0~100
Gain Control	Auto/Fixed 8~102dB
Orientation	Horizontal Mirror/Vertical Flip
Text Overlay	Time/Date/Camera/Custom OSD
Masking	5 User defined masking areas < 8% of total picture
NETWORK	
Ethernet	1 Ethernet (10/100 Base-T) RJ45 Connector, one network Coupler supplied
TCP/IP	IPv4/IPv6 (DHCP/Fixed)
Compliance	Onvif v2.2 (Profile S)

SD card	Micro SD card interface supports up to 32GB Micro SD/HC card
RTSP Video	Standard RFC2326, Support Quicktime/VLC Player. User security authentication (Enabled/Disabled)
Web Language	English, Chinese, Russian, Polish
Recording Simultaneous.	Local Micro SD Memory, Remote FTP server, TCP/UDP CMS, RTSP connection.
Network Protocols:	HTTP, TCP/IP, UDP/IP, RTSP, FTP, DHCP, NTP, PPPoE, NTP. Unicast and Multicast supported. Video streaming from SDK & NVMS/NVR software or 3rd party applications.
AUDIO	
Input / Output	1 x RCA Input/1 x RCA Output @ 1V Line Level
Audio Compression	G711 A-law, G711 u-law , RAW_PCM
GENERAL	
Power	24V AC (Local plug adaptor supplied)/30W (Max)
Support	Optional outdoor wall mounting bracket, wall mount, indoor lifting bracket
Temperature	Operating: 14°F to 131°F (-5°C to 60°C) (Built in Heater and Fan)
Installation	Wall, ceiling, wall mounted, etc.
Operating Humidity	10% - 85% RH
Approvals	CE/FCC/RoHS Compliant/IP66/IK6
Product Weight	6.0kg/13.2lb

16. Troubleshooting

Table 15-1 describes the common faults and solutions

Table 15-1 Common faults and solutions

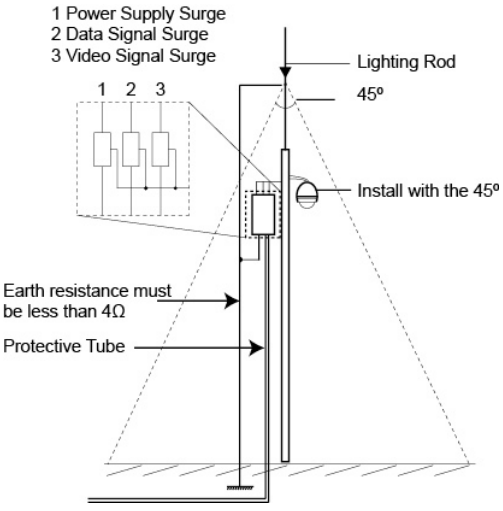
Problems	Possible Causes	Remedies
No action when power is switched on	Power supply fault	Replace
	Bad connection of the power	Check connections
	Transformer damaged	Replace
Abnormal self-check. Images with motor noise	Mechanical failure	Repair
	Camera inclined	Turn off and on again
	Power supply not giving out enough power	Replace
Normal self-check but no images	Video signal fault	Check connections
	Bad connection of the video	Check the connections
	Camera damaged	Replace
Normal self-check but out of control	Bad connection of RS485	Check the RS485 connection
	Dome ID setup is incorrect	Reselect
	Protocol setup is incorrect	Reset and Switch ON again
Vague image	Bad connection of the video	Check Ethernet cable and connection
	Power supply not giving out enough power	Replace
Dome camera out of control	Self check error	Turn off and on again
	Bad connection of control	Check connections
	Bad control of matrix	Turn off and on again
Lens of camera out of control	In manual state	Turn off and on again

17. Lightning Proof and Surge Signal Proof

The product adopts TVS lightning proof technology to prevent damage by lightning strikes below 1500W and impulse signals such as power surges, but it is also necessary to abide by the following precautions to ensure electrical safety based on practical circumstances:

- Keep the communication cables at least 50 meters away from high voltage cables or equipment.
- Make outdoor cable laying-out under eaves.
- In open areas, shield cables in a steel tube and conduct a single point to ground the tube. Do not use trolley wire.
- In strong thunderstorms or high faradic zones (such as high voltage transformer substations), use extra strong lightning proof equipment must be installed.
- Take the building lightning proof requirements into account to design the lightning proof, grounding of outdoor equipment and cable laying-out in accordance with the national and industrial standards.
- The system must be grounded with equal potentials. The earth ground connection must satisfy the anti-interference, electrical safety requirements and must not be short connected with high voltage electricity net. When the system is grounded separately, the resistance of the down conductor should be ≤ 4Ω and the sectional area of down the conductor should be ≤25mm^2 (refer to Figure 17-1).

Figure 17-1 Ground conductor



18. Declaration on Hazardous Substances in Electronic Information Products

Part	Hazardous Substances					
	Pb	Hg	Cd	Cr6+	PBB	PBDE
Mechanical part	○	○	○	○	○	○
Board/circuit module	○	○	○	○	○	○
Connector	○	○	○	○	○	○
Support cameras	○	○	○	○	○	○

○: Indicates that the concentration of the hazardous substance contained in all the homogeneous materials of this part is below the limit requirement of the SJ/T 11363−2006 standard.

×: Indicates that the concentration of the hazardous substance contained in all the homogeneous materials of this part is above the limit requirement.

01.BSM.11.0081401A